

Need/Opportunity Title: Nonintrusive Surveys in Pipes and Vessels

Need/Opportunity ID No: NV09-0001-09

Date:

Need/Opportunity Description: A method is needed for identifying and quantifying radioactive contaminants and residual materials inside pipes and vessels from an exterior side. At present, radioactive contamination cannot be identified or quantified without opening the pipes or vessels. Access is often limited to one side of the pipes and vessels.

Need/Opportunity Category: Technology Opportunity

Operations/Field Office: DOE/NV

Site: Nevada Test Site (NTS)

End User Program: Environmental Restoration Division (ERD)

Priority Rankings:

End User Program Ranking: 4 of 5

ACPC Priority: 3

Site Wide Ranking: 12 of 13

PBS Number/Title: NV214/Industrial Sites

WBS Number: 1.4.1.2.1.3.12

Waste Stream: LLW Contaminated D&D Rubble and Liquid (01025)

Background: Radioactive materials have and will build up inside pipes and vessels. In many instances, physical access to the pipe or vessel is limited. Opening the pipe or vessel for inspection may require expensive containment or result in unnecessary risk to personnel.

“Baseline” Technology/Process: Internal inspection by opening the pipe and inserting a detector and/or camera.

Cost: The cost estimate for characterization is about \$1.2 million for field labor in present day dollars.

How Long Will it Take: From 2002 to 2007.

Issues Related to Baseline:

Technical: Radioactive material inside pipes and vessels cannot be identified and quantified without opening the equipment or being able to access all sides of the pipe or vessel.

Cost: The cost savings for field labor is estimated to be on the order of less than \$0.5 million in present day dollars.

Regulatory: Not applicable.

Safety, Health, and the Environment: Exposure to personnel could occur when pipe and vessels must be opened to survey their interiors.

Stakeholder and Cultural: Decontaminating and Decommissioning (D&D) at the NTS is of general concern to the stakeholders.

Other: None.

Need/Opportunity Description: A method is needed for identifying and quantifying materials inside pipes and vessels from only one exterior side of the vessel or pipe. At present, radioactive material inside pipes and vessels cannot be identified and quantified without opening the equipment or being able to access all sides of the pipe or vessel. The technology would support the Accelerating Cleanup: Paths to Closure for D&D. Six facilities planned for D&D at the NTS,

*New need number: “NV04” = Nevada need #4; “0001” = FY2000 version #1; “5”=Priority; “S”= Science Need

as well as other DOE sites (such as Oak Ridge), could benefit from this technology.

Functional Performance Requirements: A portable system with real time output that is capable of detecting, characterizing, and quantifying radioactive contaminants and residues materials inside pipes and vessels from only one exterior side of the pipe or vessel is needed. The radioisotopes of primary concern are cobalt, cesium, plutonium, and uranium; however, the needed technology could involve only gross alpha and beta counting. Portability and capability to operate in limited space is needed (e.g., crawl spaces or pipe racks).

Schedule Requirements: D&D is scheduled to occur at six NTS facilities between FY 1998 and FY 2006. FY 1998 D&D activities would not require this technology. The real need is within the next 3 years.

Consequences of Not Filling Need/Opportunity: Some portions of a vessel or piping system may not be able to be 100 percent surveyed for potential contamination without disassembling the vessel or piping system thus increasing the risk of exposure to workers during characterization activities.

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